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Case Report

Florid artefactual signet ring cell change in the bladder: A report of two cases☆

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Abstract Artefactual signet ring cell change has been reported in the prostate following transurethral prostatic resection (TURP), biopsy and simple prostatectomy. A similar feature has not however, been reported in the bladder. Herein, two cases of artefactual signet ring cell change occurring in the bladder are presented.

1. Case 1 History and Pathology

A 61-year-old female presented with haematuria. Cystoscopy showed irregular bladder mucosa suspicious for carcinoma in-situ and two biopsies were taken. Microscopic examination showed bladder mucosa with mild urothelial hyperplasia and a patchy mild lymphocytic infiltrate. Cautery or other artefact was not a feature. Mast cells were not a noticeable feature with H&E but were numerous using toluidine blue and with CD117. In addition, there were cells with a signet ring cell morphology (vacuolated cytoplasm and a compressed peripheral crescent shaped nucleus) present mainly within the detrusor smooth muscle but also within the mucosa (Figs. 1 and 2). Immunohistochemistry with CD45 (Fig. 3) showed a minority of these cells to be lymphocytes but most to be SMA positive smooth muscle cells. Immunohistochemistry for CK7, CK20, CDX2, PSA, SMA, CD68, thrombomodulin and P63 were negative in the signet ring cells.

2. Case 2 History and Pathology

A 79-year-old man attended with a history of carcinoma of the prostate for which he had been prescribed hormonal treatment. Cystoscopy showed a thickened bladder wall and a biopsy was taken. Thickened detrusor muscle, follicular cystitis, a patchy lymphocytic infiltrate within the mucosa and the included hypertrophied detrusor muscle were identified. Cautery or mechanical artefacts were not seen. Focally there was prominent artefactual signet ring cell change involving lymphocytes and smooth muscle cells and immunohistochemistry showed similar features to the findings in case 1. In addition, few mast cells were present with H&E but were numerous using toluidine blue and particularly prominent with CD117.

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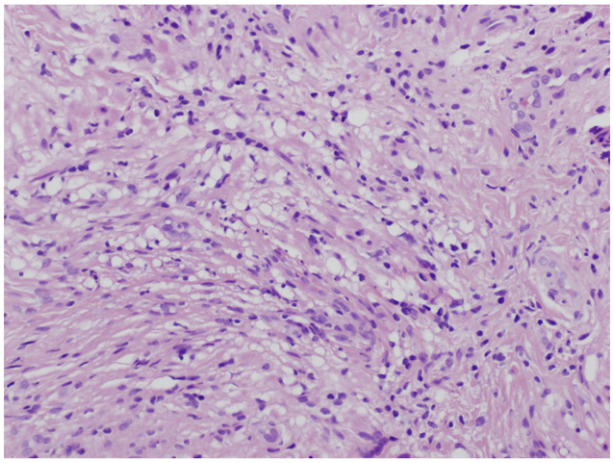

Fig. 1 Large numbers of predominantly stromal cells displaying signet ring cell change.

Because of the apparently large number of mast cells and their putative association with interstitial cystitis, three cases of interstitial cystitis retrieved from the files were reviewed. All displayed chronic inflammation, focal ulceration and large numbers of mast cells but cells displaying artefactual signet ring cell change were not present.

3. Discussion

Three previous reports documenting artefactual cell changes mimicking signet ring cell carcinoma have been cited in the prostate [1–4]. The first report was in TURP specimens which showed signet ring cell change in both lymphocytes and stromal smooth muscle cells [1]. It was considered to be a degenerative change in areas of chronic prostatitis associated with the TURP procedure. The second report identified similar artefactual change in tissue obtained with core biopsy [2]. The third report described the pseudoneoplastic change in the stromal cells of a hyperplastic prostatic nodule [4]. The authors concluded that, in the absence of mechanical or degenerative features and because of its localised nature, it was the result of unelucidated local factors. Furthermore, it has also been reported in stromal cells of the uterine cervix, in this location, the phenomenon being ascribed to cauterisation [5]. Moreover, a similar feature was described in three gastrointestinal stromal tumours, postulated to be due to degenerative metabolic cellular alterations [6]. To date, however, it has not been reported in bladder biopsies. Although acknowledging that the association is controversial a tentative association with interstitial cystitis was raised by the prominent increase in mast cells. However, signet ring cell changes were not seen in any of the three cases of interstitial cystitis we reviewed.

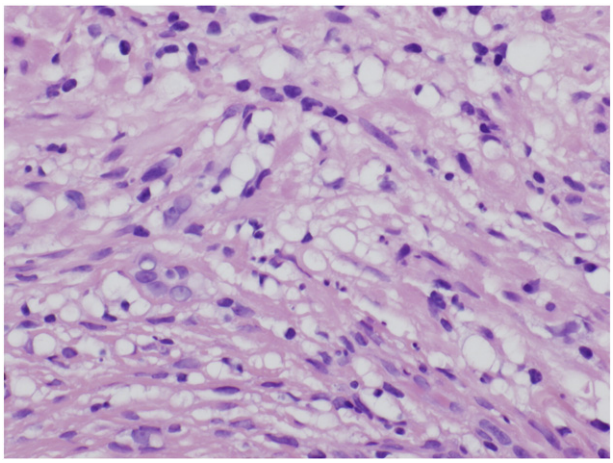

Fig. 2 Lymphocytes and stromal cells showing signet ring cell change.

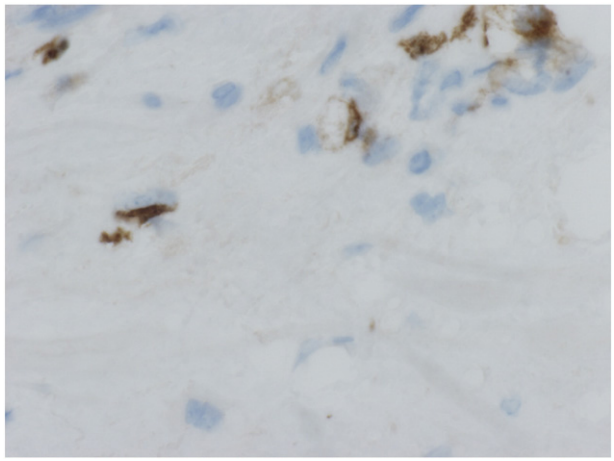

Fig. 3 Artefactual signet ring cell change in a CD45 positive lymphocyte.

The differential diagnosis of signet ring cells in the bladder includes benign and malignant tissues and lesions. Fat may be present within both the lamina propria and the muscularis propria [7]. Nephrogenic adenoma may display extensive clear cell change but is usually composed of small tubules lined by cuboidal epithelium showing minimal nuclear atypia. Urothelial carcinoma showing clear and signet ring features includes glycogen-rich carcinoma and lipid-rich carcinoma. The former are typically high grade tumours with areas of more typical urothelial carcinoma whilst the latter normally contain multivacuolated cells resembling lipoblasts in a background of high grade urothelial carcinoma. Clear cell adenocarcinoma of the bladder usually displays solid, papillary and tubulocystic patterns and may be positive for CK7 and CA125. Metastatic clear cell renal carcinoma has a CD10, vimentin, EMA and low molecular weight positive phenotype. Perivascular epithelioid cell tumours have rarely been reported in the bladder; they are usually spindled and epithelioid with variable clear cell change and display a melanocytic immunophenotype [8].

Although unlikely to be confused with signet ring cell carcinoma, nevertheless, its apparently rare, exaggerated and florid occurrence in both bladder and prostate raises the possibility of an idiosyncratic genitourinary tissue

phenomenon despite its occasional appearance in other sites/lesions. Furthermore, whilst vacuolated smooth muscle cells constitute a well known change, clustered, pseudoinfiltrating vacuolated lymphocytes may pose more diagnostic difficulty as previously suggested by Alguacil-Garcia [1].

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